



Core Maths Promoting Independence

Here's a list of **independent activities and tasks** that an AQA Core Mathematics student can complete independently outside of lessons to **supplement their classroom learning**. These tasks are designed to deepen understanding, improve problem-solving skills, and make the subject more engaging.

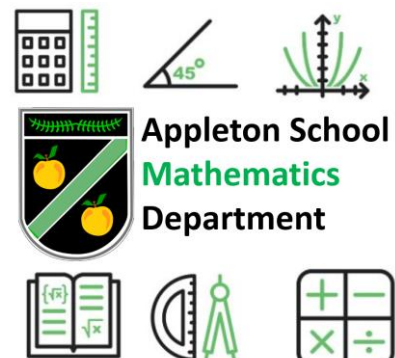
1. Podcasts & YouTube Channels

Podcasts:

- 1. The Infinite Monkey Cage (BBC Radio 4)**
 - *What it covers:* While not strictly a maths podcast, this show regularly covers topics where mathematics plays a key role, such as probability, statistics, and physics.
 - *Task:* Choose an episode on a maths-related topic, and write a reflection on how the mathematical concepts discussed relate to your AQA Core Maths syllabus.
- 2. Numberphile Podcast**
 - *What it covers:* Talks with mathematicians and math enthusiasts about interesting and fun math topics.
 - *Task:* Listen to an episode and summarize the key mathematical ideas. Research any concepts you are unfamiliar with and see if they align with topics in your syllabus.
 - **Link:** Numberphile Podcast

YouTube Channels:

- 1. Numberphile**
 - *What it covers:* Fun and engaging explanations of mathematical concepts, presented through numbers and real-world problems.
 - *Task:* Watch a video on an area of mathematics you find difficult. Try to recreate the examples shown in the video and relate them to your class topics.
 - **Link:** [Numberphile YouTube](#)
- 2. Khan Academy (Mathematics)**
 - *What it covers:* Comprehensive video tutorials covering a wide range of mathematical topics, from basic algebra to advanced calculus and statistics.
 - *Task:* Follow a specific course that aligns with your syllabus. For example, start with the "Probability and Statistics" playlist and complete the associated exercises.
 - **Link:** [Khan Academy YouTube](#)
- 3. ExamSolutions**
 - *What it covers:* Step-by-step guides to solving past A-Level and Core Maths exam questions, along with tips on understanding key concepts.
 - *Task:* Work through the past paper questions for AQA Core Maths, following the video tutorials. Make notes on strategies you can use in exams.
 - **Link:** [ExamSolutions YouTube](#)
- 4. Dr. Frost Maths**





- *What it covers:* Videos that focus on teaching and explaining the more difficult concepts in A-Level Maths, including Core Maths.
- *Task:* Use Dr. Frost Maths to practice a particular weak area, e.g., solving equations or handling large datasets.
- **Link:** [Dr. Frost Maths](#)

2. Free Online Courses

1. Khan Academy – Probability and Statistics

- *What it covers:* A structured course on statistics, which is crucial for AQA Core Maths, including probability, normal distributions, and hypothesis testing.
- *Task:* Complete the course and practice the quizzes. Compare these with your in-class exercises to assess your progress.
- **Link:** [Khan Academy Statistics](#)

2. FutureLearn – Data Science Essentials

- *What it covers:* This course provides an introduction to the data handling and analysis topics that are relevant to Core Maths, including using spreadsheets and visualizing data.
- *Task:* Apply the skills you learn in this course to a real dataset. Use Excel or Google Sheets to create graphs or analyze trends.
- **Link:** [Data Science Essentials – FutureLearn](#)

3. Coursera – Introduction to Probability and Data (Duke University)

- *What it covers:* A beginner-level course on probability, covering similar ground to the statistics units in Core Maths.
- *Task:* Complete the course and attempt to use R or another statistical software to analyze real data. Report on your findings and link them to topics in your syllabus.
- **Link:** [Coursera Probability and Data](#)

3. Books for Independent Study

1. "How to Think Like a Mathematician" by Kevin Houston

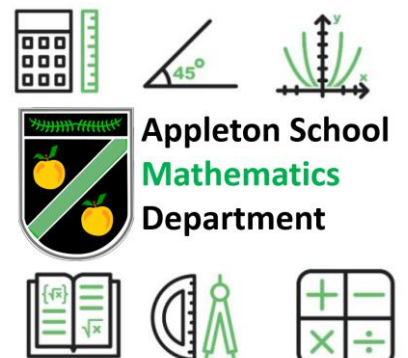
- *What it covers:* This book helps develop the mindset needed for tackling mathematical problems logically and effectively.
- *Task:* After reading, attempt problems from your textbook using Houston's approaches to logical problem-solving.

2. "Fermat's Last Theorem" by Simon Singh

- *What it covers:* A gripping story about one of the greatest mathematical problems, introducing ideas in number theory and history.
- *Task:* Write a report on how the discovery of this theorem affected modern mathematics and connect it to mathematical problem-solving techniques you've learned.

3. "Mathematics: A Very Short Introduction" by Timothy Gowers

- *What it covers:* A broader look at mathematics as a discipline, explaining abstract mathematical concepts in an engaging way.
- *Task:* Choose a topic from the book that links with your current syllabus. Research it further and present your findings.





4. Independent Tasks

1. Explore Real-World Applications of Mathematics

- *Task:* Choose a real-world problem (e.g., calculating loan repayments, modeling population growth, or analyzing election statistics) and solve it using Core Maths techniques, like percentages, statistics, or linear modeling. Document your findings.

2. Conduct a Research Project

- *Task:* Choose a topic in statistics or finance (e.g., correlation between two variables, or compound interest) and collect your own data. Analyze this data using the statistical methods from Core Maths and present a written or video report of your project.

3. Interactive Problem Solving (Dr. Frost Maths)

- *What it offers:* A variety of Core Maths topics with interactive questions, videos, and activities.
- *Task:* Set aside an hour each week to work through Dr. Frost Maths problem sets. Track your progress and focus on areas where you make mistakes. Retake quizzes to improve your performance.

5. Research-Based Challenges

1. Create a Blog or YouTube Channel

- *Task:* Regularly post videos or articles explaining key Core Maths concepts, such as normal distribution, hypothesis testing, or amortization. This will not only help with revision but also improve your communication skills.

2. Investigate Financial Mathematics

- *Task:* Research how financial mathematics is used in real-world scenarios, such as calculating mortgages, investments, or student loans. Create a report comparing various investment strategies using compound interest calculations.

3. Participate in the UKMT (UK Mathematics Trust) Challenges

- *What it offers:* Engaging mathematical challenges beyond the syllabus that encourage problem-solving and logical reasoning.
- *Task:* Compete in the UKMT Senior Challenge and try to solve their past problems, particularly those that relate to Core Maths topics like probability and statistics.
- **Link:** [UKMT](https://www.ukmt.org.uk/)

Conclusion

These independent tasks, podcasts, books, and online courses provide a wealth of opportunities for AQA Core Maths students to deepen their understanding and apply mathematical concepts outside the classroom. By combining these activities with their classroom studies, students can develop a more robust and practical grasp of Core Mathematics.

